

# Sarcoptic Mange

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## P Profile<sup>1-7</sup>

### Definition

- Sarcoptic mange (ie, sarcoptic acariasis) is a transmissible dermatosis caused by the burrowing acarid mite *Sarcoptes scabiei*.
- Infestation, referred to as *scabies*, often results in acute and intense pruritus.
- Common in domestic dogs and rare in cats, sarcoptic mange can affect other mammalian species (eg, foxes, rabbits, guinea pigs, ferrets, sheep, goats, cattle, pigs, Spanish ibex, humans).
- Scabies occurs worldwide but is more prevalent in some regions because of environmental conditions.

### Signalment

- No age, sex, or breed predilections
- Young patients may be at increased risk because of exposure in overcrowded areas (eg, shelter, kennel, pet store, breeding mill, boarding or training facility).

### Causes

- *S scabiei* is an obligate parasite that spends its entire 14–21-day life cycle on the host.
- Scabies mites are named as variants of their preferred host species.
  - *S scabiei* var *canis* (dog)
  - *S scabiei* var *vulpis* (red fox)
  - *S scabiei* var *ovis* (sheep)
  - *S scabiei* var *bovis* (cattle)



- *S scabiei* var *suis* (pig)
- Variants tend to infect certain hosts but can cause disease in other species.
  - Feline scabies is caused by *Notoedres cati*; however, *S scabiei* has reportedly caused disease in cats (rare).<sup>1</sup>
    - Location of the mite anus helps distinguish between *S scabiei* var *canis* and *N cati* (terminal in the former, dorsal in the latter).

### Risk Factors

- While not always necessary, direct contact with an infested animal, especially in an overcrowded area, increases the risk for transmission.
- Other risk factors include fox-dense regions and immunosuppression.

Although transmission may occur otherwise, direct contact with a scabies-infested animal, especially in an overcrowded area, increases the risk for transmission.

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### Pathophysiology

- Clinical disease can develop when an affected animal's mites are transmitted to the skin of another animal.
- After the mites penetrate the skin, they burrow, feed, and reproduce in superficial skin layers, often in areas with little hair.
- Pruritus occurs
  - When mite population increases
  - Through suspected hypersensitivity reaction to mite antigens
- Because *S. scabiei* and house dust mites share similar antigens, antibody cross-reactivity (influencing allergy test interpretation) and cosensitization are possible.

### History

- Historical clues suggestive of scabies may include
  - Acute and severe nonseasonal pruritus
  - Exposure to roaming foxes
  - Recent history of adoption or boarding
  - Cohabitation with multiple animals, several of which may be pruritic
  - Lack of acaricidal therapy in monthly ectoparasite preventives
  - Fair-to-poor response to previously administered antiinflammatory glucocorticoids and/or cyclosporine
  - Humans in the household may be pruritic and have erythematous papules.

### Clinical Signs

#### Dogs

- Pruritus
  - Moderate to extreme
  - Observable at physical examination
- Distribution
  - Sparsely haired body regions: Pinnal margins (not otic canals), periocular skin, elbows (Figure 1),

hocks, and ventral trunk (Figure 2)

- May become widespread as alopecia becomes more severe
- Dorsum and paws are often spared (Figure 3).
- Lesions
  - Peracute: Lesional pruritus that may mimic allergic skin disease
  - Acute: Erythematous maculopapular eruptions that eventuate into crusted papules with excoriations and alopecia
  - Chronic: Diffuse exfoliation with hyperpigmented lichenification

and hyperkeratotic calluses on elbows and hocks

- Aural hematoma can occur at any disease stage.
- Some dogs may not develop skin lesions despite intense pruritus (ie, scabies incognito), while others (ie, immunosuppressed) have widespread lesions with minimal pruritus (ie, crusted or Norwegian scabies).
- Secondary skin infection
  - Superficial pyoderma and/or *Malassezia* spp dermatitis are common sequelae.



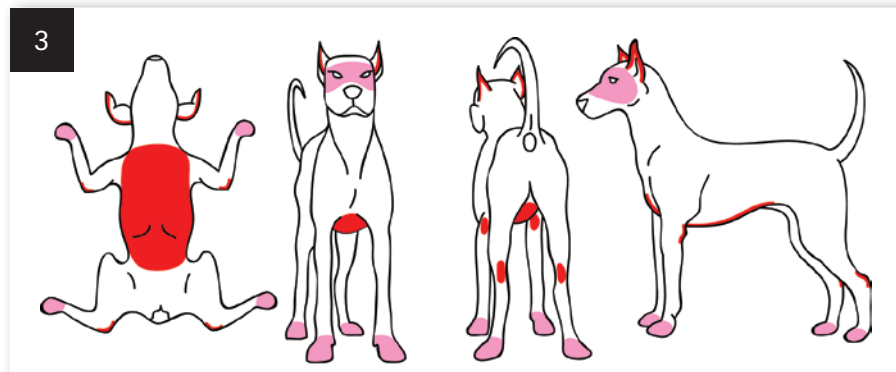
Sarcoptic mange presenting as crusting excoriation along the left caudolateral elbow of a dog.



Pruritic papular rash with lichenification on ventral trunk of a dog with sarcoptic mange.

Distribution pattern of disease for canine scabies.<sup>2</sup>

■ Common ■ Less Common



- Extracutaneous signs
  - Lethargy
  - Depression
  - Inappetence
  - Weight loss
  - Peripheral lymphadenomegaly
- Nonclinical carriers may exist.

Cats

- Pruritus is nonexistent to moderate.
- Distribution on bridge of nose, face, pinnae, paws, and tail
- Lesions include crusted papules and alopecia.
- Extracutaneous signs include poor body condition and peripheral lymphadenomegaly.

**Dx** Diagnosis<sup>1-4</sup>

Definitive

- Definitive evidence involves microscopic finding of scabies mites, mite eggs, or mite feces (Figure 4) on superficial broad skin scrapings from representative nonexcoriated lesions or fecal flotation findings.
- Circumstantial evidence includes history, signs, and positive pinnal-pedal response (uncontrollable scratching/thumping with a pelvic limb when the ipsilateral pinnal margin is scratched).
  - Clinical resolution following appropriate scabicial therapy also indicative

- Paucity of *S scabiei* exists when dogs are hypersensitive to mite antigens, so negative skin scrapings and/or fecal examination do not exclude scabies.
- Mites are usually numerous and easy to find on skin scrapings from immunosuppressed dogs (crusted scabies).

Differential

Dogs

- Folliculitis (eg, superficial pyoderma, demodicosis, dermatophytosis)
- *Malassezia* spp dermatitis
- *Pelodera* spp mange
- Allergic skin disease
- Contact dermatitis
- Ear margin dermatosis
- Zinc-responsive dermatosis
- Pemphigus foliaceus
- Neoplasia



**Sarcoptes acariasis mite**  
Courtesy of Dr. Thomas Craig, Texas A&M University

Cats

- *Demodex gatoi* infestation
- Otodectic mange
- Cheyletiellosis
- Notoedric mange
- Herpesvirus dermatitis
- Allergic skin disease

Laboratory Testing

Indicated

- Skin surface cytology to exclude concurrent bacterial and/or fungal infection

May be Indicated

- ELISA serologic testing for IgG against *Sarcoptes* spp antigens
  - Available in some countries, but false-positive (eg, cross-reactivity with house dust mite) and negative (eg, dogs receiving glucocorticoids) results can occur.
- Skin biopsy to exclude other differentials
- CBC, serum chemistry panel, urinalysis, and feline retroviral testing when other comorbidities are suspected as based on history and physical examination
- Before extralabel macrocyclic lactone therapy
  - Testing for heartworms when status is unknown or questionable
  - *ABCBIΔ* genetic testing to screen for avermectin sensitivity in ivermectin-sensitive dogs (eg, herding dogs, sight hounds) before the use of extralabel macrocyclic lactone therapy

**Tx** Treatment<sup>1-4,8,9</sup>

- Dogs with unexplained pruritus, particularly unresponsive to glucocorticoids (eg, prednisone 1 mg/kg q24h) should receive trial therapy for scabies before making a diagnosis of allergy.

MORE ►



- Duration of scabicial therapy should encompass at least two mite life cycles (at least 4–6 weeks) regardless of the product prescribed.
- *S. scabiei* can be transmitted to other close-contact animals and humans; all close-contact animals (notably dogs) should be treated concurrently.
- In general, systemic scabicial therapy (including correctly applied systemic spot-on) is more effective than topical treatment for scabies because of improved compliance.
- Assuming all close-contact animals are treated, environmental decontamination is not typically needed, unless scabies outbreak occurs in an overcrowded facility.
- Scabies-infested dogs and cats can be treated as outpatients; use of topical amitraz dips (dogs) should be reserved for in-hospital use.

#### Supportive Medical Care (see Medications)

- Antiseborrheic shampoo can facilitate removal of excessive surface scale and crusting.
- Concurrent pyoderma and/or *Malassezia* spp dermatitis must be treated.
  - In dogs, systemic azole therapy (inhibitor of P-glycoprotein) cannot be given concurrently with extralabel (high-dose) macrocyclic lactones such as ivermectin (substrate of P-glycoprotein), as doing so may cause signs of ivermectin-sensitivity.
  - Sole topical therapy directed against yeast may be needed to avoid potential drug interactions.
- Worsening pruritus is normal during the first days of treatment, so systemic glucocorticoids (dogs, prednisone 1 mg/kg PO q24h 3–7d; cats, prednisolone 2 mg/kg PO q24h 3–7d) or oclacitinib (dogs, 0.4–0.6 mg/kg PO q12h 3–7d) are often indicated.
- Aural hematomas should be decompressed.

#### Nutritional Aspects

- The patient should receive an age-appropriate balanced diet.

#### Client Education

- Humans who develop itchy skin ( $\pm$  lesions) should contact their physician.



### Medications<sup>1-7, 9-12</sup>

*Note: Recommended treatments are mostly considered extralabel as described.*

#### Canine Sarcoptic Mange

##### Systemic

- Ivermectin: 0.2–0.4 mg/kg SC q14d 3–4 doses or 0.2–0.4 mg/kg PO q7d 4–6 doses
- Doramectin: 0.2–0.6 mg/kg SC q7d 4–6 doses
- Moxidectin: 0.2–0.3 mg/kg SC q7d 3–4 doses or 0.2–0.3 mg/kg PO q7d 4–6 doses
- Moxidectin 2.5% + imidacloprid 10% topical spot-on: Applied q2–4wk 2–4 doses (based on manufacturer's established body weight range)
- Selamectin topical spot-on: Applied q2–4wk 3–4 doses (based on manufacturer's established body weight range)
  - Dermatologists have safely used this protocol in herding canine breeds.

##### Topical

- Amitraz: 0.025%–0.03% solution applied to entire skin surface q1–2wk 4–6 doses
  - Do not rinse.
  - May need to clip coat to facilitate contact
- Lime sulfur: 2%–3% solution applied to entire skin surface q7d 4–6 doses
  - Do not rinse.
  - May need to clip coat to facilitate contact
  - Fipronil spray: 3 mL/kg applied as

fine mist to entire skin surface

q2–3wk 3 doses or 6 mL/kg sponged on the skin q7d 4–6 doses

- May be better reserved for subclinical close-contact dogs

#### Feline Sarcoptic Mange

##### Systemic

- Ivermectin: 0.2–0.3 mg/kg SC q2wk 3–4 doses
- Doramectin: 0.2–0.3 mg/kg SC as a single dose or repeated in 2 weeks
- Moxidectin 2.5% + imidacloprid 10% topical spot-on: Applied q2wk 3–4 doses (based on manufacturer's established body weight range)
- Selamectin topical spot-on: Applied q2wk 3–4 doses (based on manufacturer's established body weight range)

##### Topical

- Lime sulfur: 2%–3% solution applied to entire skin surface q7d 4–6 doses
  - Do not rinse.
  - May need to clip coat to facilitate contact

#### Precautions & Drug Interactions

- Dogs with an ivermectin-sensitive genotype (eg, herding dogs, sight hounds) should not receive extralabel macrocyclic lactone therapy (eg, ivermectin, doramectin, moxidectin) because of risk for neurotoxicosis signs.
- Neither spinosad-containing flea preventives nor systemic azole therapy (eg, ketoconazole, itraconazole) can be given concurrently with extralabel macrocyclic lactones in any dog (neurotoxicosis).
- Amitraz dip treatment should be used cautiously in small dogs and should not be used for Chihuahuas.
  - Do not administer concurrently with monoamine oxidase inhibitors in any dog.
  - Whether amitraz is optimal should be strongly considered;

- in-hospital application is recommended, and administrative personnel are at risk for adverse effects.
- For nonclinical dogs, fipronil spray may be cost-effective in a multidog household.

## Follow-up

### Patient Monitoring

- Pruritus should be significantly improved after the first two doses of scabicial therapy (within 3 weeks), but mild pruritus may linger for several weeks.
- If skin lesions fail to improve after 3–4 weeks of therapy, skin culture and/or biopsy may be indicated.

### Complications

- Treatment failure may occur if
  - Using topical spot-on for patients with body weights nearing the upper limit of the manufacturer's recommended body weight range (ie, underdosed therapy)
  - All close-contact animals (especially dogs) or secondary infections are not concurrently treated

## \* In General

### Relative Cost

- Canine sarcoptic mange: \$–\$\$
- Feline sarcoptic mange: \$–\$\$
- Sarcoptic mange in multipet household: \$\$\$–\$\$\$\$

### Cost Key

\$ = up to \$100  
 \$\$ = \$101–\$250  
 \$\$\$ = \$251–\$500  
 \$\$\$\$ = \$501–\$1000  
 \$\$\$\$\$ = more than \$1000

### Prognosis

- Good

### Prevention

- Routine use of flea preventives containing acaricides may lessen chances for scabies after casual exposure to an infested animal. ■ **cb**

See **Aids & Resources**, back page, for references & suggested reading.

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